

Title (en)
GAS TURBINE ENGINE WITH TRANSCRITICAL VAPOR CYCLE COOLING

Title (de)
GASTURBINENMOTOR MIT KÜHLUNG DURCH TRANSKRITISCHEN DAMPFZYKLUS

Title (fr)
MOTEUR À TURBINE À GAZ AVEC REFROIDISSEMENT À CYCLE DE VAPEUR TRANSCRITIQUE

Publication
EP 3296665 A1 20180321 (EN)

Application
EP 17191939 A 20170919

Priority
US 201615269217 A 20160919

Abstract (en)
A gas turbine engine (20) has a compressor section (24), a combustor (56), and a turbine section (28). An associated fluid is to be cooled and an associated fluid is to be heated. A transcritical vapor cycle (185; 234; 240) heats the fluid to be heated, and cools the fluid to be cooled. The transcritical vapor cycle (185; 234; 240) includes a gas cooler (165; 246) in which the fluid to be heated is heated by a refrigerant in the transcritical vapor cycle (185; 234; 240). An evaporator heat exchanger (174; 254) at which the fluid to be cooled is cooled by the refrigerant in the transcritical vapor cycle (185; 234; 240). A compressor (188; 242) upstream of the gas cooler (165; 246) compresses the refrigerant to a pressure above a critical point (160) for the refrigerant. An expansion device (194; 248) expands the refrigerant downstream of the gas cooler (165; 246), with the evaporator heat exchanger (174; 254) being downstream of the expansion device (194; 248), and such that the refrigerant passing through the gas cooler (165; 246) to heat the fluid to be heated is generally above the critical point (160).

IPC 8 full level
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Citation (search report)

- [X1] US 2014260340 A1 20140918 - VAISMAN IGOR [US], et al
- [A] US 2005061012 A1 20050324 - ZYWIAK THOMAS [US], et al
- [A] US 2015007600 A1 20150108 - GODECKER WILLIAM J [US], et al

Cited by
EP4148252A1; GB2610566A; US12006055B2; US11993387B2; US11920540B2; US11994067B2

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Designated extension state (EPC)
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DOCDB simple family (application)
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